GRADE STRUCTURE: Market Pulp

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Basic groups: Market pulp is divided into two basic groups: paper-grade pulps and dissolving or special alpha pulps. Most paper-grade market pulps are produced by chemical processes, although some are made by mechanical methods, such as stone groundwood, thermomechanical pulp (TMP), chemithermomechanical pulp (CTMP), and bleached chemithermomechanical pulp (BCTMP). Dissolving and special alpha pulps have a high alpha (pure cellulose) content and are used to make rayon, acetate, and other cellulose derivatives as well as specialty papers.

Paper grades: Chemical paper-grade pulps produced in North America can be further divided according to pulping process (sulfate/kraft or sulfite), basic wood type (softwood or hardwood), producing region (northern or southern), and brightness level (bleached, semibleached, or unbleached). The four important grades of chemical paper-grade pulp are (in descending order of quality, as measured in terms of price) bleached northern and southern softwood and bleached northern and southern hardwood. Fluff pulp (mainly bleached softwood kraft) goes into nonpaper applications, such as baby diapers, but it is included in paper-grade pulp for statistical purposes.

Bleached kraft: Bleached sulfate (kraft) is the predominant grade of market pulp. The largest percentage of production is made from softwood fibers, such as spruce, fir, and pine. A type of hardwood pulp not produced domestically but fully accepted in North America and around the world is bleached eucalyptus kraft pulp.

Since breaking into the world pulp scene more than two decades ago, eucalyptus shipments have grown from 434,000 tonnes in 1976 to 6.0 million tonnes in 1998. Unbleached kraft market pulp production has declined in North America. The total 1998 production of 367,000 tonnes accounted for only 2.4 percent of North American chemical paper-grade market pulp production. Much of the unbleached kraft market pulp in the U.S. is used in electrical grades such as transformer board, condenser board, and electrical boards as well as filter papers, gaskets for cars and motors, and other specialties.

Dissolving Pulp: Dissolving pulps are used in producing man-made

Grade Centers

- **newsprint**
- **groundwood / mechanical**
- **free-sheet / woodfree**
- **corrugating medium**
- **linerboard**
- **cartonboard / folding boxboard**
- **tissue**
- **pulp**
- **recovered paper**
- **woodfiber / timber**
- **nonwovens**

fibers (rayon and acetate), films (cellophane), plastics (cellulose acetates), and chemicals (methyl cellulose and carboxymethyl cellulose). Also referred to as chemical cellulose, these pulps are highly purified grades composed of 95 percent to 99 percent cellulose.

Most dissolving pulps are made from softwood, although some hardwood is used. They can be made via the prehydrolyzed sulfate process or the modified acid sulfite process. Dissolving pulps differ in purity and reactivity. Sulfite dissolving pulps are the most reactive pulps, suitable for producing rayon and cellophane. Prehydrolyzed sulfate pulps generally produce a stronger rayon fiber for applications such as high-wet-modulus textile rayon and high-tenacity rayon tire cords.

Fluff Pulp: Fluff pulp is usually produced in roll form and shipped to manufacturers of sanitary disposable products, who then disintegrate the thick pulp sheets into individual fibers to give their products bulk, softness, and high absorbency.

Market Deinked Pulp: Prior to the 1990s, North America had only six MDIP mills -- one in Canada and five in the U.S. -- producing less than half a million short tons. Deinked pulp markets were robust early in the 1990s, when capacity was low and demand was growing rapidly. Printing/writing mills were looking for market postconsumer-content pulp to use in developing new recycled products. During this time, some existing mills that were making other grades saw opportunities and reconfigured equipment to enable them to produce MDIP pulp.

By 1994, North American MDIP capacity totaled 17 facilities making 1.2 million tons/yr (14 were in the U.S. and three were in Canada). Growth peaked in 1997, when capacity among the 24 facilities reached 2.2 million tons/yr, four times the pre-1990s amount; all the new mills were in the U.S.

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